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F2M

## (54) Space frame nodal connector

(57) A spaceframe connector which includes a tetrahedral body (10) with planar faces (14) on which are formed raised central hexagonal regions (16). A coupling member (12) with a recessed central section (30) seats on one of the regions (16). The coupling member has a rib (32) which contacts sides of the hexagonal region (16) thereby providing a compact rigid connector able to withstand torsional forces. Frame members (34) locate in holes (28) in the coupling member and bolts (36) locate through holes (18, 21) to secure the coupling member to the connector.

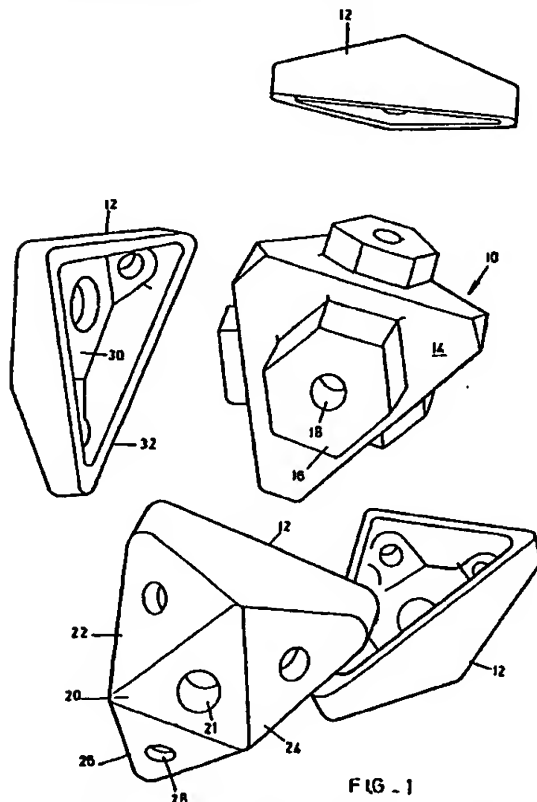


FIG. 1

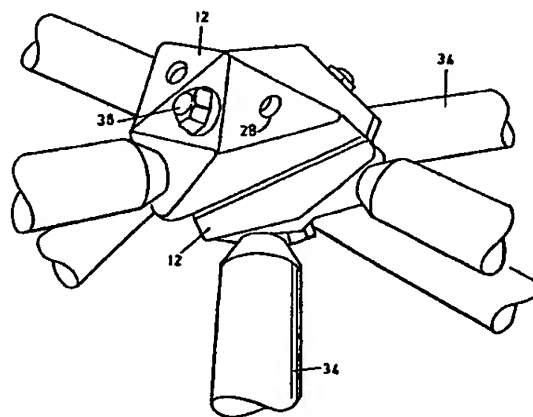


FIG. 2

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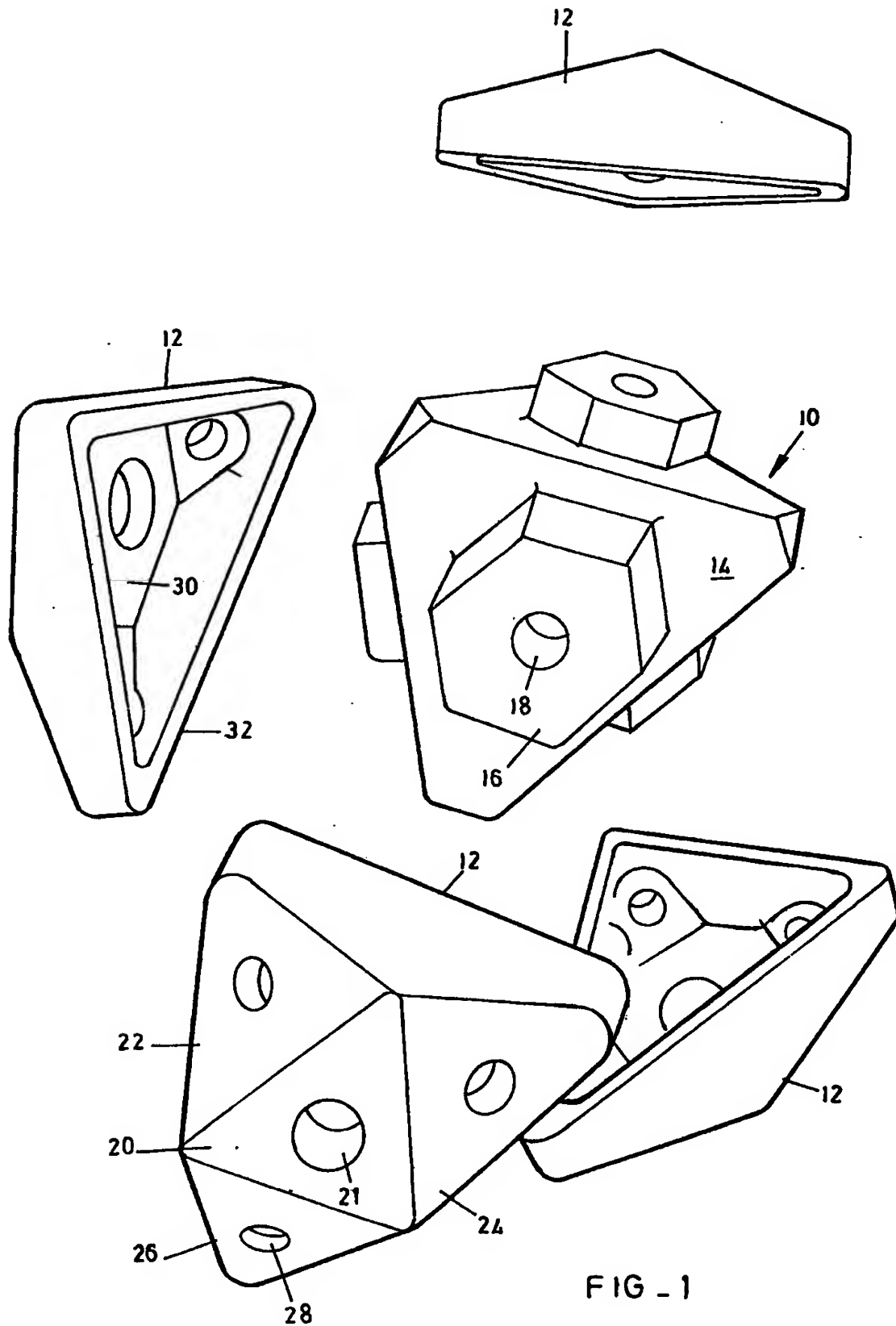


FIG - 1

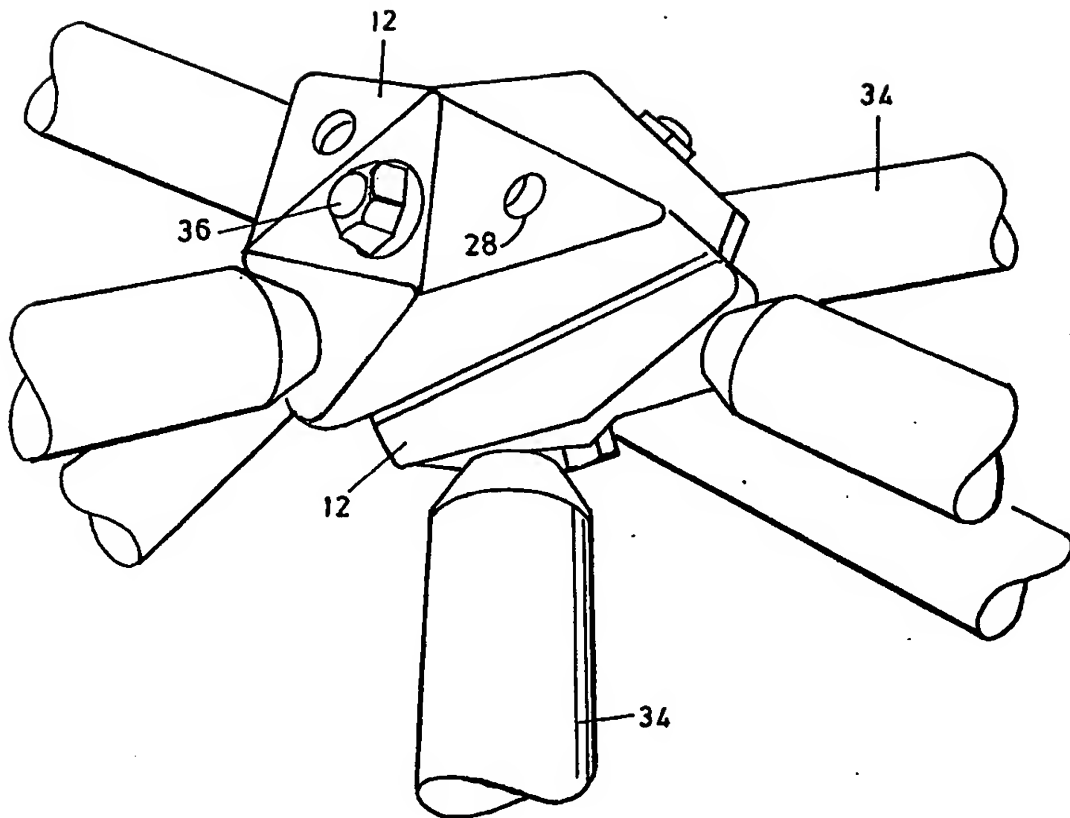


FIG - 2

## SPECIFICATION

## Spaceframe connector

This invention relates to a connector of the kind used in the construction of framework assemblies, spaceframes, and the like.

The specification of South African patent No. 75/7133 discloses a connector which includes a faceted node and shaped plates which are engageable with the node. The plates are bent to a particular shape and, in use, are secured to one or more cross members.

In the applicant's experience when the connector is used in certain configurations of framework assemblies the plates can distort and are not completely satisfactory.

The present invention provides a connector which comprises a body on which are formed a plurality of faces, and at least one coupling member which is engageable with one of the faces and which in use is secured to a support member, the coupling member including

strengthening formations for increasing its rigidity. Preferably the strengthening formations include at least one rib. The rib may be located at the periphery of the coupling member.

The coupling member may include a central region, which may be planar, and which is adapted for secular to the face, and the rib may extend generally at right angles to the planar region.

The coupling member may include a plurality of surfaces, preferably three, arranged about the central region, which are each adapted to receive a support member.

The rib may seat on the face.

The face and the coupling member may include interengageable formations which prevent, or inhibit, relative rotation between the coupling member and the body.

The face may be substantially planar with a central portion which is raised relatively to the remainder of the face.

The coupling member may include a recessed inner surface which engages with the central portion of the face. Preferably at least a section of an inner side wall of the rib is brought into contact with the central portion.

In a preferred embodiment of the invention the body is of substantially tetrahedral shape with each face being substantially planar and having a substantially hexagonal raised central region, and the coupling has a peripheral rib which seats on the planar face and contacts the central region.

The invention is further described by way of example with reference to the accompanying drawings in which:

Figure 1 is an exploded view of a coupling according to the invention, and

Figure 2 is a perspective view of the coupling of Figure 1 assembled and connected to supporting members.

Figure 1 illustrates a coupling according to the invention which includes a tetrahedral body 10 and four coupling members each designated by the reference numeral 12.

Each of the four sides of the body 10 is substantially triangular in plan and consists of a generally planar peripheral surface 14 and a raised central region 16 which is substantially hexagonal in outline. A tapped hole 18 is formed centrally in the raised region 16.

Each coupling member 12 includes a planar central region 20 with a hole 21 and three sloping surfaces 22, 24 and 26 arranged symmetrically around the central region 20. Each of the surfaces 22 to 26 is formed with a hole 28.

Each coupling member has, on its inner surface, a central section 30 which is hexagonal in outline and which conforms to the central raised region 16 of the body 10. A continuous rib 32 extends around the coupling member and defines three sides of the hexagonal central region 30.

Figure 2 illustrates the connector of Figure 1 fully assembled and engaged with eight support members 34 although only seven of the members are visible in the drawings.

The coupling members 12 are placed on the body 10 alternately displaced through 180 degrees. Before this however the support members 34 which consist of elongate tubes the ends of which are reduced in diameter in a conical fashion and internally threaded, are secured as desired to the coupling members by passing bolts through selected holes 24 and screwing the bolts into the tubes. The coupling members are thereafter bolted to the body 10 by means of bolts 36 which pass through the holes 21 in the coupling members into the tapped holes 18 in the body.

In Figure 2 the uppermost four of the tubes 34 are coplanar while the lower four tubes are relatively displaced by 45 degrees in plan and in elevation from the upper tubes.

When the coupling members 12 are bolted to the body 10 the hexagonal central region 30 of each coupling member receives the raised central region 16 of the associated face.

The peripheral rib 32 seats on the planar region 14 of the face and sections of the inner wall of the rib 32 come into contact with opposing surfaces of the central raised region 16 of the face.

The net effect of the interengaging formations on the body 10 and each coupling member 12 is that a closely cooperating structure is provided which is able to withstand considerable relative torsional forces between each coupling member on the one hand and the remaining coupling members or the body on the other hand. In addition the peripheral rib 32 on each coupling member considerably strengthens and rigidifies each of the coupling members thereby increasing the load carrying ability of the connector.

## CLAIMS

1. A connector which comprises a body on which are formed a plurality of faces, and at least one coupling member which is engageable with one of the faces and which in use is secured to a support member, the coupling member including strengthening formations for increasing its rigidity.

2. A connector according to claim 1 wherein the strengthening formations include at least one rib.

3. A connector according to claim 2 wherein the rib is located at the periphery of the coupling member.

4. A connector according to claim 2 or 3 wherein the coupling member has a central region which at least on its inner surface is planar and the rib extends generally at right angles to the region.

5. A connector according to claim 4 in which the coupling member includes a plurality of surfaces arranged about the central region, which are each adapted to receive a support member.

6. A connector according to any one of claims 1 to 5 where each face on the body is substantially

planar with a central portion which is raised relatively to the remainder of the face.

7. A connector according to claim 6 in which the coupling member has a recessed inner surface which engages with the central portion of the face.

8. A connector according to claim 1 wherein the body is of substantially tetrahedral shape with each face being substantially planar and having a substantially hexagonal raised central region, the strengthening formations on the coupling member including a peripheral rib which seats on the planar face and contacts the central region.

9. A connector substantially as hereinbefore described with reference to the accompanying drawings.